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August 10, 2015

**--Via U.S. Mail and Electronic Filing--**

Darrell Nitschke, Executive Secretary  
North Dakota Public Service Commission  
State Capitol  
600 East Boulevard  
Bismarck, ND 58505-0480

RE: ELECTRIC METERING AND TESTING TARIFF MODIFICATION  
CASE NO. PU-15-\_\_\_\_\_

Dear Mr. Nitschke:

Northern States Power Company, doing business as Xcel Energy, submits the attached miscellaneous tariff filing to modify the meter testing language in the Company's North Dakota Electric Rate Book, NDPSC No. 2.

The proposed revisions will align the tariff language more closely with operating changes we are making to improve efficiency and effectiveness in our testing practices.

If you have any questions concerning this filing, feel free to contact me at 701-241-8632.

Sincerely,

A handwritten signature in blue ink that reads 'David H. Sederquist'.

DAVID H. SEDERQUIST  
SENIOR REGULATORY AND FINANCIAL CONSULTANT

Enclosures

STATE OF NORTH DAKOTA  
BEFORE THE  
PUBLIC SERVICE COMMISSION

Julie Fedorchak  
Brian P. Kalk  
Randy Christmann

Chair  
Commissioner  
Commissioner

IN THE MATTER OF THE PETITION OF  
NORTHERN STATES POWER COMPANY  
TO MODIFY ITS ELECTRIC METER  
TESTING TARIFF

CASE NO. PU-15-\_\_\_\_

**PETITION**

**INTRODUCTION**

Northern States Power Company, doing business as Xcel Energy, submits this Petition for approval to modify its electric meter testing tariff.

Pursuant to ND Century Code §49-05-05, the Company seeks approval to implement a change in electric meter testing protocols and modify its tariffs accordingly. The Company proposes to convert its in-service electric meter testing from a “periodic” basis to an annual “sample” basis. The Company seeks this modification in order to levelize the number of meters tested each year, increase metering accuracy, and reduce meter testing costs.

In this Petition, we provide an overview of the existing rules governing meter testing, describe the way we currently conduct meter testing, and discuss our proposed change.

**GENERAL FILING INFORMATION**

**Name, Address, and Telephone Number of Utility Attorney**

Alison C. Archer  
Assistant General Council, Xcel Energy Services, Inc.  
414 Nicollet Mall – 5<sup>th</sup> Floor  
Minneapolis, MN 55401  
(612) 215-4662

## **Utility Employee Responsible for Filing**

Paul J Lehman  
Manager, Regulatory Compliance and Filings  
414 Nicollet Mall – 7<sup>th</sup> Floor  
Minneapolis, Minnesota 55401  
(612) 330-7529

## **DESCRIPTION AND PURPOSE OF THE PROPOSED MODIFICATIONS**

### **I. Background**

North Dakota Statutes require the Commission “from time to time” test meters “for the purpose of determining the accuracy of the meters.”<sup>1</sup> The statutes also require that the Commission establish regulations to determine accuracy and prescribe reasonable testing procedures.<sup>2</sup>

The Commission promulgated regulations governing the procedures utilities must use to test metering equipment as well as regulations describing the standards and accuracy measures required in such tests.<sup>3</sup> These regulations were last amended July 1, 1997. On February 27, 1998, the Company filed proposed tariff revisions with the Commission for approval. The tariff revisions were approved by the Commission on May 21, 1998 and remain in effect today.

### **A. Current Meter Testing Protocols**

All *new* electric meters purchased by the Company are tested by the meter manufacturer prior to shipping, and the manufacturer’s test results are reviewed by the Company. Upon receipt of shipment, the Company sample tests each shipment to assure compliance with its accuracy requirements.

Depending on the type, all *in-service* electric meters are tested either on a periodic basis or through a sampling approach. Periodic testing refers to a schedule whereby all meters of the same type are tested within a designated time period. The current meter testing protocols specified in the tariff call for testing schedules that range from annual sample tests to periodic tests every 8 or 16 years for the majority of meter types, as shown in Tables 1A and 1B.

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<sup>1</sup> North Dakota Cent. Code §§ 49-02-08, 49-02-09.

<sup>2</sup> North Dakota Cent. Code §§ 49-02-10, 49-02-11.

<sup>3</sup> North Dakota Admin. Code §§ 69-09-02-26, 69-09-02-20, 69-09-02-21, 69-09-02-22, 69-09-02-25, 69-09-02-27.

**Table 1A**  
***Sample Tested Meters***

<b>Type of Meter</b>	<b># Meters</b>	<b>% All Meters</b>	<b>Interval</b>
Self-contained, single phase (Non-demand metered)	84,640	91.7%	Annual
Self-contained, poly-phase (Non-demand metered)	1,318	1.4%	Annual
Transformer-rated, single phase (Non-demand metered)	109	0.1%	Annual
Totals – Sample Tested	86,067	93.2%	

**Table 1B**  
***Periodic Tested Meters***

<b>Type of Meter</b>	<b># Meters</b>	<b>% All Meters</b>	<b>Interval</b>
Self-contained, single phase (Demand metered)	967	1.0%	16 years
Self-contained, poly-phase (Demand metered)	1,768	1.9%	16 years
Transformer-rated, single phase (Demand metered)	395	0.4%	16 years
Transformer-rated, poly-phase (Demand metered)	2,349	2.5%	16 years
Transformer-rated, poly-phase (Non-demand metered)	3	0.0%	16 years
Self-contained, transformer- rated, time-of-use or recording meters and battery equipped devices	790	0.8%	8 years
Totals – Periodic Tested	6,272	6.8%	

As shown in Table 1A, the vast majority (86,067 or 93.2 percent) of electric meters are sample tested in combined lots. The lots are selected on a company-wide basis and include meters from Minnesota and South Dakota as well as meters from North Dakota. The remaining 6,272 electric meters shown in Table 1B are tested on a periodic basis over either 8- or 16-year intervals.

Sample testing is conducted in conformity with American National Standard for Electric Meters--Code for Electricity Metering (ANSI C12.1). Meters are grouped together in lots using selection criteria including meter manufacturer, model, AEP test code, and other attributes as required for analysis. Annually, meters are randomly selected from each lot for testing, they are removed from the field and tested in our Minneapolis meter testing shop, and the test results are analyzed in accordance with tables in ANSI/ASQC Z1.9 *Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming, using inspection Level II with an acceptable quality level of 2.5 or better and specification limits of +/- 2%*. Each meter is tested at two load designations: full load (FL) and light load (LL).

Individual meters that are found to be more than 0.5 percent fast or slow are not returned to service (retired). Meters are also retired if they are found to be physically damaged or otherwise inoperable.

## **II. Proposed Meter Testing Protocols**

As indicated in Table 2A, the Company proposes to convert most of the meter types currently subject to periodic testing to testing on a sample basis. Today, sample testing is an industry standard and practiced by utilities across the country. Xcel Energy has successfully implemented sample meter testing programs similar to this proposal in most of our other service territories including Colorado, Minnesota, Wisconsin, South Dakota, and Michigan. The same benefits derived from sample testing in our other jurisdictions can be replicated in North Dakota.

The only periodic tested meters that would not be converted are the approximately 80 substation meters and transformer-rated poly-phase meters used with instrument transformers on loads greater than 1 MW. The Company proposes to continue testing these meters on a periodic basis, but the 8-year cycle will be shortened to every year. This is due to the complexity and high kWh usage of the facilities these meters are used for.

Note that the Company does not propose any changes to the standards for evaluating meter performance or acceptance criteria. The only modification proposed is to adopt sample testing for the majority of meters currently tested on a periodic basis.

**Table 2A**  
**Proposed *Sample* Tested Meters**

<b>Type of Meter</b>	<b># Meters</b>	<b>% All Meters</b>	<b>Interval</b>
Self-contained, single phase (Non-demand metered)	84,640	91.7%	Annual
Self-contained, single phase (Demand metered)	967	1.0%	Annual
Self-contained, poly-phase (Non-demand metered)	1,318	1.4%	Annual
Self-contained, poly-phase (Demand metered)	1,768	1.9%	Annual
Transformer-rated, single phase (Non-demand metered)	109	0.1%	Annual
Transformer-rated, single phase (Demand metered)	395	0.4%	Annual
Transformer-rated, poly-phase (Non-demand metered)	3	0.0%	Annual
Transformer-rated, poly-phase (Demand metered)	2,349	2.5%	Annual
Self-contained, transformer- rated, time-of-use or recording meters and battery equipped devices	710	0.8%	Annual
Totals – Sample Tested	92,259	99.9%	

**Table 2B**  
**Proposed *Periodic* Tested Meters**

<b>Type of Meter</b>	<b># Meters</b>	<b>% All Meters</b>	<b>Interval</b>
Transformer-rated, poly-phase meters: a) in substations on primary service > 600V, or b) with demands > 1 MW	80	0.1%	8 years
Totals – Periodic Tested	80	0.1%	

For purposes of the proposed new meter testing tariff, the meter testing changes shown in Tables 2A and 2B can be streamlined as shown in Table 3:

**Table 3**  
**Proposed Testing Schedule**

<b>Type of Meter</b>	<b>Testing Schedule</b>
Self-contained single and poly-phase	Sample – yearly
Transformer-rated single and poly-phase	Sample – yearly
Transformer-rated poly-phase in substations on primary services > 600V	Periodic – yearly
Transformer-rated poly-phase with demands > 1 MW	Periodic – yearly

### **III. Benefits of Proposed Changes**

The benefits of moving to sample testing include levelizing the number of meters tested each year, increasing metering accuracy, and reducing the overall costs of in-service meter testing. We provide further discussion of each of these benefits below.

#### **A. Sample Testing Will Levelize the Yearly Testing Workload**

Under the current periodic testing program, the number of meters tested each year can fluctuate substantially. This is primarily because the meters designated for testing in a given year are determined based on the number of years since the last test was performed for a given meter.

Anticipated meter testing in years 2016 and 2017 reflect extreme examples of how the number of tests can fluctuate from year to year. Most meters that were installed in 2000 and on a 16-year periodic testing schedule are now out of service, replaced by the roll-out of Automated Meter Reading (AMR) meters in 2001. So, the total number of 2000 vintage meters slated for testing in 2016 is very low. By contrast, in 2001 we installed an unusually high number of AMR meters for most of our demand metered customers in North Dakota. Because these meters also fall into the 16-year periodic testing group, the corresponding number of meters slated for testing in 2017 is quite high.

Table 4 shows the estimated number of periodic-based meter tests that would be performed during the next 16-year cycle under our current testing protocols:

**Table 4**  
**Estimated Periodic Meter Tests by Year**  
**(Using Test Protocols Currently in Place)**

Test Year	Quantity
2016	15
2017	2,287
2018	297
2019	200
2020	201
2021	194
2022	450
2023	108
2024	133
2025	485
2026	420
2027	403
2028	794
2029	341
2030	624
2031	108
<b>Total</b>	<b>7,060</b>

It is evident from the table that, even beyond 2017, there is still considerable variation in the number of annual periodic tests as a result of fluctuations in annual customer growth, meter installations, retirements, and unusual circumstances which can drive replacement of large numbers of in-service meters (such as flooding, etc.). It is for this reason the Company recommends smoothing the quantity of meters tested each year to facilitate better testing resource planning and improve productivity. By moving to sample testing, the Company can manage the testing process and workload by establishing manageable and uniform annual sample sizes.

#### **B. Sample Testing Improves Meter Accuracy**

As a general matter, statistical sample meter testing not only improves testing efficiency--it also produces results that are more representative of all the similar type meters in the given lot. The Company has self-checked the sampling method by re-testing the same lot with multiple iterations of random samples.



Very similar statistical results were seen, confirming the validity of this approach and indicating that sample testing is more effective than periodic testing when it comes to identifying accuracy problems within specific types of meters.

By grouping meters into lots by type and function, and then sample testing annually, the accuracy of the entire lot can be more readily and effectively tracked over time, and there is more data with which to perform statistical analysis. Since annual sample testing produces representative data on a more frequent basis, it provides an earlier indication of accuracy issues and results in quicker action to address those issues for a given lot (as opposed to 8- or 16-year periodic cycles).

Moving to a sampling methodology for these meter types will not affect the right North Dakota customers have under tariff Section 3.1 to request a specific meter test if they have a concern with their meter's accuracy.

### **C. Sample Testing is Cost Effective**

Finally, sample testing is more cost effective than periodic testing. As stated previously and shown on Table 1B, 6,272 meters are currently periodic tested on either an 8- or 16-year interval. We project that, under our current testing protocols, these meters will generate approximately 7,060 periodic meter tests over the 16-year period from 2016 through 2031, as shown on Table 4 (note that some meters on an 8-year cycle will be tested twice within the 16-year period). If this same population of periodically tested meters is converted to sample testing, the number of projected tests would be reduced by over 80 percent; only 1,259 meter tests would need to be conducted during this same 16-year cycle.

However, for a small subset of specialized meters in the group described as “Self-contained, transformer rated, time-of-use or recording meters and battery equipped devices” and periodic-tested on an 8-year cycle, the Company proposes to stay with the periodic test method but to move to a more frequent *annual* test interval. For the 80 meters in this subgroup (defined as “transformer-rated poly-phase meters in substations on primary services above 600V or transformer-rated poly-phase meters with demands greater than 1 MW”), there would be 80 annual tests for this group, or 1,280 tests over the 16 years from 2016-2031.

Thus, if we add the number of tests projected for the meters in Table 1B that will be converted from periodic- to sample-based testing to the additional

periodic tests for the 80 specialized meters that will shift from an 8-year interval to an annual interval, we estimate the total number of tests performed over the 16-year period under the Company's proposal will be 2,539. The Company's proposal to move most of the periodic-tested meters to sample tests would result in a net reduction of  $7,060 - 2,539 = 4,521$  meter tests over the period. If one assumes an average cost of approximately \$68 per test,<sup>4</sup> the productivity improvement would be valued at just over \$300,000.

## **REQUESTED CHANGES TO TARIFF**

We have proposed modifications to the following tariff sheets.

### **North Dakota Electric Rate Book – NDPSC No. 2:**

Sheet No. 6-13, revision 2

Sheet No. 6-14, revision 2

Sheet No. 6-15, revision 3

Legislative and non-legislative versions of the proposed tariff sheets have been provided as Attachment A.

We propose that the tariffs be effective November 1, 2015.

This change will not affect the Company's overall revenue requirements, rates, or earnings in North Dakota.

## **CONCLUSION**

We believe that our proposal to convert about 7 percent of our in-service meters from periodic testing to sample testing is reasonable and supported by the public interest. These proposed modifications are in line with today's meter technology and industry standards.

We respectfully request that the Commission approve the Company's proposed modifications to its electric meter testing protocols and related tariffs to bring meter testing in-line with industry standards. The Company's proposal to convert most of the electric meters tested on a "periodic" basis to an annual "sample" basis is reasonable and results in substantial benefits, including levelizing the number of meters tested each year, increasing the accuracy of

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<sup>4</sup> Estimated Cost Per Test: \$11.19 Shop Labor + \$52.31 Field Labor + \$4.41 Vehicle Cost = \$67.91

metering based on test frequency, and reducing the cost of in service meter testing.

Dated: August 10, 2015

Northern States Power Company

## **Legislative**

**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6

~~1st~~2nd Revised Sheet No. 13

**SECTION 3 METERING AND BILLING**

**3.1 METERING AND TESTING**

**Metering**

The Company will furnish, install, and maintain one set of metering equipment for each account and rate schedule under which service is supplied. The location, number of meters and appurtenances, and specifics of installation will depend on the service arrangements and requirements of the rate schedules.

**Customer Request for Meter Testing**

The customer may request the Company to test its meter. If the request to test a meter is made within one year of a previous meter test, a charge will be added to customer's bill if the metering equipment tests accurate in accordance with ~~the Public Service~~ Commission standards. The charge ~~must~~will be waived if the meter error is more than plus or minus two percent.

**Meter Error**

In the event the Company's test shows meter error in excess of accepted or prescribed tolerance, the Company will adjust the bills for service during the period of registration error ~~equal to defined as~~ one-half the time elapsed since the ~~most recent~~last previous meter test, ~~but not to~~ ~~This period shall not~~ exceed six months. Adjustments shall be based on actual monthly consumptions.

If the average meter error cannot be determined because of failure of part or all of the metering equipment, the customer shall pay an amount based upon registration of check metering equipment or an estimated amount based upon the customer's consumption for comparable operations over a similar period. Any adjustment because of metering equipment failure shall be from the date of the metering equipment failure, if known, or if not known, for a period equal to one-half the time elapsed since the last previous meter test, but not to exceed six months.

**Testing Process for New Electric Meters (Single Phase and Polyphase)**

New meters, whether single phase or polyphase, self-contained or transformer rated, are normally sample tested ~~(where a random selection of meters from a lot is tested every year and the condition of the sample is used to determine the performance of the group and whether or not it remains in service)~~ for accuracy when they are received from the supplier. The Company requires the meter supplier to provide certified test data for all new meters demonstrating the "as left" calibration for each meter is within the Company's ~~accuracy~~ requirements.

New transformer rated meter installations are also checked within sixty days of being energized and having customer load connected to ensure proper installation. This procedure is normally repeated if the current transformers and/or voltage transformers are replaced.

(Continued on Sheet No. 6-14)

Date Filed: ~~42-07-07~~08-10-15 By: ~~David M. Sparby~~Christopher B. Clark Effective Date: ~~03-01-09~~  
President ~~and CEO of~~, Northern States Power Company, a Minnesota corporation  
Case No. ~~PU-07-776~~PU-15- Order Date: ~~12-31-08~~

**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6

~~1st~~2nd Revised Sheet No. 14

**3.1 METERING AND TESTING (Continued)**

**Testing Process for In-Service Meters**

In-service meters are either sample tested or periodically tested (where all the meters in a defined grouping are tested within a certain period) depending on meter type as indicated in the following table:

<u>Type of Meter</u>	<u>Type of Testing</u>
<u>Self-contained single and polyphase</u>	<u>Sample – yearly</u>
<u>Transformer-rated single and polyphase</u>	<u>Sample – yearly</u>
<u>Transformer-rated polyphase meters in substations on primary services (services above 600V)</u>	<u>Periodic – yearly</u>
<u>Transformer-rated polyphase meters with demands greater than 1MW (during previous calendar year)</u>	<u>Periodic – yearly</u>
<del>Self-contained single phase, non-demand</del>	<del>Sample—yearly</del>
<del>Self-contained single phase, demand</del>	<del>Periodic—16 years</del>
<del>Transformer rated single phase, non-demand</del>	<del>Sample—yearly</del>
<del>Transformer rated single phase, demand</del>	<del>Periodic—16 years</del>
<del>Self-contained polyphase, non-demand</del>	<del>Sample—yearly</del>
<del>Self-contained polyphase, demand</del>	<del>Periodic—16 years</del>
<del>Transformer rated polyphase, non-demand</del>	<del>Periodic—16 years</del>
<del>Transformer rated polyphase, demand</del>	<del>Periodic—16 years</del>
<del>Self-contained and transformer rated time-of-use (TOU) and/or recording meters and battery equipped devices</del>	<del>Periodic—8 years</del>

**1. Sample Testing Program**

Meters to be sample tested on a yearly basis are placed in groups, or “lots.” These lots are defined ~~by~~ based on the manufacturer, model type, and the industry standard test code. Each lot may be further separated into additional lots by individual or combinations of parameters such as serial numbers, purchase date, firmware revision, etc.

ANSI/ASQC Z1.9 Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming, is a sampling plan that specifies procedures by which an analysis of failures in a limited sample can determine the expected failure rate of an entire population. The Company uses tables from ANSI/ASQC Z1.9 to evaluate the performance of in-service meters that have been grouped into lots for random sample testing. Testing is performed in accordance with ANSI/ASQC Z1.9, Inspection Level II with an acceptable quality level of 2.5 or better and specification limits of +/- 2%.

(Continued on Sheet No. 6-15)

Date Filed: 42-07-0708-10-15 By: ~~David M. Sparby~~Christopher B. Clark Effective Date: 03-01-09  
President~~and CEO~~<sub>1</sub> of Northern States Power Company, a Minnesota corporation  
Case No. PU-07-776PU-15- Order Date: 42-31-08

**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6

~~1st~~<sup>2nd</sup> Revised Sheet No. 14

If a sample ~~unexpectedly fails~~<sup>lot does not meet acceptance criteria for the first time</sup>, the Company will ~~observe-analyze~~<sup>the test results for unusual test data or individual meter test results that are several standard deviations from the mean. If anomalies have occurred, and cause are the reason for</sup> the lot to ~~fail-perform below acceptance criteria~~<sup>the Company will monitor the lot more closely in subsequent years. One of three options may be employed:</sup>

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- 1) a second sample may be taken and tested,
- 2) ~~the lot may be separated by an additional parameter such as serial number and retested as multiple lots in subsequent years, or~~
- 3) ~~the lot may be left as is. If the lot fails-performs below acceptance criteria again, further analysis of the cause of failure is made to determine appropriate remedial action. If necessary, removal of an under-performing failed lot is accomplished as soon as practicable by the Company's normal operating personnel.~~

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(Continued on Sheet No. 6-15)

Date Filed: ~~12-07-07~~<sup>08-10-15</sup> By: ~~David M. Sparby~~<sup>Christopher B. Clark</sup> Effective Date: ~~03-01-09~~  
President~~-and CEO~~<sub>1</sub> of Northern States Power Company, a Minnesota corporation  
Case No. ~~PU-07-776~~<sup>PU-15-</sup> Order Date: ~~12-31-08~~

**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6

~~2nd~~<sup>3rd</sup> Revised Sheet No. 15

**3.1 METERING AND TESTING (Continued)**

**Testing Process for In-Service Meters** (Continued)

As meters are tested in the sample testing plan, individual meters are calibrated – if design permits – if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test. Meters that require electronic reconfiguration due to their installation application will be individually re-programmed; calibration tested, and demand checked/tested as appropriate.

**2. Periodic Testing Program**

Meters to be periodically tested ~~will be tested annually are placed in groups, or periodic lots. Lots are defined by manufacturer, model type, and the industry standard test code. The scheduled test for each meter will be established by specified test schedule and the last test date or the original receipt of the meter, whichever is most recent.~~

Meters that are on a periodic schedule may be tested and re-installed, tested and retired, or placed on a retirement list prior to their required test date based on the lot's performance or other factors impacting the Company's meter management decisions. As meters are tested in the periodic testing plan, individual meters are calibrated – if design permits – if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test. Meters that require electronic reconfiguration due to their installation application will be individually re-programmed; calibration tested, and demand checked/tested as appropriate.

**Testing Process for Reconditioned Meters**

**1. ~~Mechanical Meters~~ Electro-Mechanical and Electronic Meters**

Re-serviceable meters removed from a customer premise are reconditioned by cleaning, testing, and calibration prior to re-installation. Meters are ~~calibrated-retired~~ if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test.

**2. ~~Electronic Meters~~**

~~Re-serviceable meters removed from a customer premise are reconditioned by cleaning, re-programming, and testing prior to re-installation. Many electronic meters have no calibration adjustment, but if possible they are calibrated if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test. If the meter has no calibration adjustment, and is found to be more than +/- 1.0% inaccurate, it is retired or repaired.~~

Customers may contact the Company to report a concern with the accuracy of their electric meter. The Company will investigate an electric meter within ten calendar days of receiving a report from a customer questioning its accuracy. In the event that the Company fails to investigate a potentially malfunctioning meter within ten days of the customer's contact, and the meter is later found to be malfunctioning, it will not rebill the customer for any discrepancy in the amount owed for service occurring between when the customer contacted the Company regarding a concern with their meter and when the meter was investigated.

Date Filed: ~~02-27-09~~<sup>08-10-15</sup>

By: ~~David M. Sparby~~<sup>Christopher B. Clark</sup>

Effective Date: ~~04-01-09~~

President, ~~and CEO of~~ Northern States Power Company, a Minnesota corporation

Case No. ~~PU-09-09~~<sup>PU-15-</sup>

Order Date:



## **Non-Legislative**

**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

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**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6  
2nd Revised Sheet No. 13

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**SECTION 3 METERING AND BILLING**

**3.1 METERING AND TESTING**

**Metering**

The Company will furnish, install, and maintain one set of metering equipment for each account and rate schedule under which service is supplied. The location, number of meters and appurtenances, and specifics of installation will depend on the service arrangements and requirements of the rate schedules.

**Customer Request for Meter Testing**

The customer may request the Company to test its meter. If the request to test a meter is made within one year of a previous meter test, a charge will be added to customer's bill if the metering equipment tests accurate in accordance with Commission standards. The charge will be waived if the meter error is more than plus or minus two percent.

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**Meter Error**

In the event the Company's test shows meter error in excess of accepted or prescribed tolerance, the Company will adjust the bills for service during the period of registration error defined as one-half the time elapsed since the last previous meter test, but not to exceed six months. Adjustments shall be based on actual monthly consumptions.

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If the average meter error cannot be determined because of failure of part or all of the metering equipment, the customer shall pay an amount based upon registration of check metering equipment or an estimated amount based upon the customer's consumption for comparable operations over a similar period. Any adjustment because of metering equipment failure shall be from the date of the metering equipment failure, if known, or if not known, for a period equal to one-half the time elapsed since the last previous meter test, but not to exceed six months.

**Testing Process for New Electric Meters (Single Phase and Polyphase)**

New meters, whether single phase or polyphase, self-contained or transformer rated, are normally sample tested for accuracy when they are received from the supplier. The Company requires the meter supplier to provide certified test data for all new meters demonstrating the "as left" calibration for each meter is within the Company's accuracy requirements.

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New transformer rated meter installations are also checked within sixty days of being energized and having customer load connected to ensure proper installation. This procedure is normally repeated if the current transformers and/or voltage transformers are replaced.

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(Continued on Sheet No. 6-14)

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Date Filed: 08-10-15

By: Christopher B. Clark

Effective Date:

President, Northern States Power Company, a Minnesota corporation

Case No. PU-15-

Order Date:

**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6  
2nd Revised Sheet No. 14

**3.1 METERING AND TESTING (Continued)**

**Testing Process for In-Service Meters**

In-service meters are either sample tested or periodically tested (where all the meters in a defined grouping are tested within a certain period) depending on meter type as indicated in the following table:

<u>Type of Meter</u>	<u>Type of Testing</u>
Self-contained single and polyphase	Sample – yearly
Transformer-rated single and polyphase	Sample – yearly
Transformer-rated polyphase meters in substations on primary services (services above 600V)	Periodic – yearly
Transformer-rated polyphase meters with demands greater than 1MW (during previous calendar year)	Periodic – yearly

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1. Sample Testing Program

Meters to be sample tested on a yearly basis are placed in groups, or "lots." These lots are defined based on the manufacturer, model type, and the industry standard test code. Each lot may be further separated into additional lots by individual or combinations of parameters such as serial number, purchase date, firmware revision, etc.

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ANSI/ASQC Z1.9 Sampling Procedures and Tables for Inspection by Variables for Percent Nonconforming, is a sampling plan that specifies procedures by which an analysis of failures in a limited sample can determine the expected failure rate of an entire population. The Company uses tables from ANSI/ASQC Z1.9 to evaluate the performance of in-service meters that have been grouped into lots for random sample testing. Testing is performed in accordance with ANSI/ASQC Z1.9, Inspection Level II with an acceptable quality level of 2.5 or better and specification limits of +/- 2%.

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If a sample lot does not meet acceptance criteria, the Company will analyze the test results for unusual test data or individual meter test results that are several standard deviations from the mean. If anomalies have occurred, and cause the lot to perform below acceptance criteria, the Company will monitor the lot more closely in subsequent years. One of three options may be employed:

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- 1) a second sample may be taken and tested,
- 2) the lot may be separated by an additional parameter such as serial number and retested as multiple lots in subsequent years, or
- 3) the lot may be left as is. If the lot performs below acceptance criteria again, further analysis of the cause of failure is made to determine appropriate remedial action. If necessary, removal of an under-performing lot is accomplished as soon as practicable by the Company.

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(Continued on Sheet No. 6-15)

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President, of Northern States Power Company, a Minnesota corporation

Case No. PU-15-

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**NORTH DAKOTA ELECTRIC RATE BOOK - NDPSC NO. 2**

**GENERAL RULES AND REGULATIONS (Continued)**

Section No. 6  
3rd Revised Sheet No. 15

**3.1 METERING AND TESTING (Continued)**

**Testing Process for In-Service Meters** (Continued)

As meters are tested in the sample testing plan, individual meters are calibrated – if design permits – if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test. Meters that require electronic reconfiguration due to their installation application will be individually re-programmed; calibration tested, and demand checked/tested as appropriate.

**2. Periodic Testing Program**

Meters to be periodically tested will be tested annually.

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Meters that are on a periodic schedule may be tested and re-installed, tested and retired, or placed on a retirement list prior to their required test date based on the lot's performance or other factors impacting the Company's meter management decisions. As meters are tested in the periodic testing plan, individual meters are calibrated – if design permits – if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test. Meters that require electronic reconfiguration due to their installation application will be individually re-programmed; calibration tested, and demand checked/tested as appropriate.

**Testing Process for Reconditioned Meters**

**1. Electro-Mechanical and Electronic Meters**

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Re-serviceable meters removed from a customer premise are reconditioned by cleaning, testing, and calibration prior to re-installation. Meters are retired if the “as found” test results show an error greater than +/- 0.5% during either the full load or light load test.

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Customers may contact the Company to report a concern with the accuracy of their electric meter. The Company will investigate an electric meter within ten calendar days of receiving a report from a customer questioning its accuracy. In the event that the Company fails to investigate a potentially malfunctioning meter within ten days of the customer's contact, and the meter is later found to be malfunctioning, it will not rebill the customer for any discrepancy in the amount owed for service occurring between when the customer contacted the Company regarding a concern with their meter and when the meter was investigated.

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